AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Previously Presented) A method of detecting a fundamental beat frequency in a predetermined time interval of a music signal, comprising:

    a) processing a music signal with the discrete wavelet transform to obtain a set of coefficients;

    b) processing a subset of the coefficients to obtain a plurality of candidate beat frequencies contained in the corresponding portion of the music signal;

    c) determining the harmonic relationships between the candidate beat frequencies; and

    d) determining the fundamental beat frequency based upon the determined harmonic relationships.

2. (Previously Presented) The method of claim 1, wherein determining the fundamental beat frequency comprises selecting one of the candidate beat frequencies having a non-ambiguous harmonic structure.

3. (Previously Presented) The method of claim 1, wherein determining harmonic relationships comprises determining integer relationships between the candidate beat frequencies.

4. (Previously Presented) The method of claim 1, wherein:

the candidate beat frequencies each comprise a range of frequencies;

processing a subset of the coefficients comprises calculating autocorrelation values; and

determining the fundamental beat frequency comprises:

identifying the candidate beat frequency having a non-ambiguous harmonic structure and the strongest relative amplitude value calculated to model human auditory perception;

determining the harmonic relationship between the candidate beat frequency having a non-ambiguous harmonic structure and the strongest relative amplitude value calculated to model human auditory perception, and the lowest candidate frequency having a non-ambiguous harmonic structure; and

selecting the fundamental beat frequency as the frequency range of the lowest candidate beat frequency having a non-ambiguous harmonic structure multiplied by the harmonic relationship.

5. (Currently Amended) The method of claim 1, wherein

processing a subset of the coefficients to obtain a plurality of candidate beat frequencies comprises calculating autocorrelation values of a subset of the coefficients; and

determining the fundamental beat frequency comprises determining the fundamental beat frequency based upon the determined harmonic relationships and the relative amplitude values calculated to model human auditory perception.

6. (Previously Presented) The method of claim 1, wherein processing a subset of the coefficients to obtain a plurality of beat frequencies comprises creating a buffer of a predetermined number of coefficients.

7. (Previously Presented) The method of claim 6, wherein processing a subset of the coefficients comprises creating a dynamic and weighted histogram of beat frequencies.

8. (Previously Presented) The method of claim 7, wherein creating a dynamic and weighted histogram comprises consolidating values in adjacent bins of the histogram.

9. (Previously Presented) The method of claim 8, wherein consolidating values in adjacent bins of the histogram comprises using a mathematical window function.

10. (Canceled)

11. (Currently Amended) An apparatus for analyzing the beat of a music signal[[,]] comprising:

a fundamental beat frequency identifier generating a fundamental beat frequency signal from the music signal;

a time domain envelope analyzer comprising a peak generator generating a peak signal from the music signal, the peak signal comprising amplitude and time values of amplitude peaks of the music signal; and

a comparator and beat identifier, coupled to the fundamental beat frequency identifier and the time domain envelope analyzer, and generating, from the peak signal and fundamental beat frequency signal, a series of time values identifying the amplitude peaks corresponding to onset times of beats within periods based on the fundamental beat frequency signal.

12. (Currently Amended) An apparatus for generating a multimedia signal[[,]] comprising:

a gauge comprising:

a first input terminal receiving an image signal comprising digital data representing a plurality of still images;

a second input terminal receiving a digital audio signal;

a third input terminal receiving a minimum display period;

a first output terminal supplying the number of still images for display; and

a second output terminal supplying a music signal generated from the digital audio signal and having a duration at least as long as the number of still images multiplied by the minimum display period;

a beat analyzer receiving the music signal and generating a series of onset times and amplitude values of amplitude peaks occurring at the onset of predominant beats;

a beat strength sorter coupled to the beat analyzer and generating a first array of beat elements corresponding to the amplitude peaks, each element comprising a beat onset time and a beat amplitude value, the first array sorted according to the beat amplitude values;

a selector coupled to the gauge and the beat strength sorter, the selector generating a second array of beat elements sequentially selected from the first array and having a number of beat elements that is at least equal to one less than the number of still images; and

a synchronizer coupled to the gauge and the selector, the synchronizer generating a digital multimedia signal comprising an audio component corresponding to the music signal and a video component corresponding to a sequential output of the still images, the sequential advance times of the still images corresponding to the beat onset times of the second array beat elements.

13. (Currently Amended) An apparatus for generating a multimedia signal[[,]] comprising:

a music and video processor receiving a digital moving video data signal and a digital music data signal, the music and video processor generating:

a video clip signal comprising the digital moving video data signal separated into video clips; and

an array of selected beat elements corresponding to amplitude peaks of the digital music data signal, [[each]] one or more elements comprising a beat onset time relative to the digital music data signal and a beat amplitude value;

a video clip play order selector coupled to the music and video processor, the video clip play order selector comprising:

an audio array generator receiving the array of selected beat elements and generating a sequential set of audio durations, the sum of the audio durations being equal to the duration of the digital music data signal; and

a video editor receiving the video clip signal and generating a video output signal comprising a sequential series of video elements corresponding on a one-to-one basis to the sequential set of audio durations, each of the video elements comprising at least a portion of at least one of the video clips; and

an audiovisual sequencer coupled to the video clip play order selector and generating a multimedia digital output signal having a video component formed from the video output signal and an audio component formed from the digital music data signal.

14. (New) A method of detecting the localized fundamental beat frequency of a digital music signal comprising:

detecting time period peaks above a threshold in at least two, consecutive, predetermined-sized buffers of an autocorrelation function of a decomposition of a digital music signal using a discrete wavelet transform;

determining which one or more of the detected time period peaks is heard most often in the at least two, consecutive, predetermined-sized buffers, thereby creating a set of "often-heard" beat frequencies in a localized portion of the digital music signal and wherein one or more beat frequencies in the set has a magnitude representing how often it is heard;

determining the harmonic structure between each beat frequency in the set and the remaining beat frequencies in the set, and

selecting one of the "often-heard" beat frequencies as the localized fundamental beat frequency, wherein the criteria for selection comprise the greatest magnitude and a non-ambiguous harmonic structure.

15. (New) The method of claim 14, wherein detecting time period peaks above a threshold comprises:

half-wave rectifying the autocorrelation values of the at least two consecutive predetermined-size buffers of the autocorrelation function;

identifying time period peaks based on the rectified autocorrelation values; and

comparing the rectified autocorrelation values of the identified time period peaks to a threshold, thereby detecting time period peaks above a

threshold.

16. (New) The method of claim 15, wherein identifying time period peaks based on the rectified autocorrelation values comprises:

determining the maximum rectified autocorrelation value and an average noise value of the rectified autocorrelation values;

indicating the start of a peak as a time period whose rectified autocorrelation value is greater than the previous autocorrelation value and greater than the average noise value of the rectified autocorrelation values; and

identifying the time period corresponding to the turnover point after the start of a peak as a time period peak; and

wherein the threshold equals a predetermined percentage of the maximum rectified autocorrelation value.

17. (New) The method of claim 14, wherein determining which one or more of the detected time period peaks is heard most often comprises:

providing a histogram bin for each frequency corresponding to a time period in the autocorrelation function;

creating a dynamic and weighted histogram of integrated autocorrelation values of detected time period peaks in two or more consecutive buffers of the at least two, consecutive, predetermined-sized

buffers, wherein creating the dynamic and weighted histogram comprises:

integrating the autocorrelation values of detected time period peaks in the two or more consecutive buffers by multiplying them by a predetermined integration value;

increasing the corresponding histogram bin's value by the integrated autocorrelation value of a detected time period peak; and

decreasing the corresponding histogram bin's value by the predetermined integration value to a minimum of zero if the time period of the autocorrelation function is not a detected time period peak,

thereby creating a dynamic and weighted histogram; and

picking the one or more frequencies corresponding to the histogram bins with peak values as the set of "often heard" beat frequencies in the localized portion of the music signal, wherein each frequency in the set has a magnitude represented by the histogram bin value.

18. (New) The apparatus of claim 11, further comprising a preprocessor to convert an input music signal having a number of channels and a sampling rate to a music signal having one channel and a 22.05 kHz sampling rate.

19. (New) The apparatus of claim 11, further comprising a time stamp adjuster to set the time values of the series of time values generated by the comparator and beat identifier to the time difference between the beat onset and the start of the music signal.

20. (New) A method of identifying beats in a music signal that correspond to a fundamental beat frequency comprising:

determining a fundamental beat frequency in a music signal using a discrete wavelet transform;

obtaining an envelope signal of the music signal, wherein the envelope signal contains amplitude peaks of the music signal that represent beats in the music signal; and

identifying one or more peaks in the envelope signal as beats in a music signal that correspond to a fundamental beat frequency.

21. (New) A method of automatically generating an electronic slide show comprising:

receiving a set of still images to display, a minimum display period, and a music signal;

creating a workable set of images and accompanying music signal; and

identifying a set of onset times that correspond to a fundamental beat frequency in the music signal;

selecting one or more onset times from the set of onset times of beats, wherein the one ore more selected onset times are spaced at least a minimum display period apart; and

displaying the set of still images such that the display of a still image of the set of still images starts at one of the one or more selected onset times.

22. (New) A method of automatically generating a multimedia signal in which significant changes in video content occur on beats that correspond to a fundamental beat frequency in the accompanying music content, the method comprising:

receiving video content and music content;

creating a set of video clips from the video content;

creating a set of onset times of beats that correspond to a fundamental beat frequency in the music content from a transformation of the music content with a discrete wavelet transform;

choosing a subset of the set of onset times of beats as times at which to make an obvious change in video content, wherein the resulting audio duration between one or more pairs of consecutive onset times in the chosen subset is at least equal to a predetermined value;

editing the video clips to fit the resulting audio durations; and

outputting a multimedia signal that will play the edited video clips accompanied by the music content, wherein significant changes in video content occur on beats that correspond to a fundamental beat frequency in accompanying music content.